

REMARKS

This communication is a full and timely response to the final Office Action dated May 13, 2005 (Paper No./Mail Date 050305). By this communication, Applicant has amended claims 1 and 13.

Claims 1 and 13 were each amended to cancel subject matter related to ZrO_2 and HfO_2 . No new matter has been added.

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendment: (a) places the application in condition for allowance (for the reasons discussed herein); (b) does not raise any new issues requiring further search and/or consideration; (c) satisfies a requirement of form asserted in the previous Office Action; and (d) places the application in better form for appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of this amendment is respectfully requested. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

Claims 1-5 and 13-16 are pending where claims 1 and 13 are independent.

Rejections Under 35 U.S.C. §102

Claims 1, 3, and 4 were rejected under 35 U.S.C. §102(e) as anticipated by *Jeon*, U.S. Patent Application Publication No. 2003-0194853. Applicant respectfully traverses this rejection.

Claim 1 recites a semiconductor device comprising a semiconductor substrate; a high-dielectric-constant film on the semiconductor substrate; and a nitride layer on the high-dielectric-constant film, wherein the high-dielectric constant film is selected from film comprised of enhanced dielectric materials including Al_2O_3 and PrO_2 , silicate film derived from said enhanced dielectric materials, film having multi-element materials including a combination of Al_2O_3 and PrO_2 , and film having multi-layered structures including at least two layers of said silicate film.

Jeon discloses a method of making a semiconductor device. The semiconductor device includes a dielectric 110 formed on a substrate 102. The dielectric 110 includes alternating sub-layers 110a-110e. Regarding sub-layers 110a-110e, the lowermost layer or the uppermost layer in the layered structure may be a high-K dielectric material depending upon the number of layers and desired configuration. *Jeon* discloses that the high-K dielectric film may include various

elements but fails to disclose, teach, or suggest that those elements include Al_2O_3 and PrO_2 . For at least this reason, *Jeon* fails to anticipate claim 1.

To properly anticipate a claim, the document must disclose, explicitly or implicitly, each and every feature recited in the claim. See Verdegall Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). *Jeon* fails to disclose, teach, or suggest every element recited in independent claim 1, therefore these claims are not anticipated by *Jeon*.

Accordingly, Applicant respectfully requests that the rejection of claim 1 under 35 U.S.C. §102 be withdrawn, and this claim be allowed.

Claims 3 and 4 depend from claim 1. By virtue of this dependency, Applicant submits that claims 3 and 4 are allowable for at least the same reasons given above with respect to claim 1. In addition, Applicant submits that claims 3 and 4 are further distinguished over *Jeon* by the additional elements recited therein, and particularly with respect to each claimed combination. Applicant respectfully requests, therefore, that the rejection of claims 3 and 4 under 35 U.S.C. §102 be withdrawn, and these claims be allowed.

Rejections Under 35 U.S.C. §103

Claims 2, 5, and 13-16 were rejected under 35 U.S.C. §103(a) as unpatentable over *Jeon* in view of *Ramkumar*, U.S. Patent No. 6,436,848. Applicant respectfully traverses this rejection.

Claim 13 recites a semiconductor device comprising a semiconductor substrate; a gate insulating film on the semiconductor substrate; and a gate electrode formed on the gate insulating film and including at least a p-type impurity-contained layer, wherein the gate insulating film includes a high-dielectric-constant film and a nitride layer on the high-dielectric-constant film, and wherein the high-dielectric constant film is selected from film comprised of enhanced dielectric materials including Al_2O_3 and PrO_2 , silicate film derived from said enhanced dielectric materials, film having multi-element materials including a combination of Al_2O_3 and PrO_2 , and film having multi-layered structures including at least two layers of said silicate film.

The Office Action acknowledges that *Jeon* fails to disclose, teach, or suggest at least a boron doping p-type impurity polysilicon layer, and relies on *Ramkumar* to remedy this deficiency. However, in addition, Applicant respectfully submits that *Jeon* further fails to disclose, teach, or suggest at least that the high-dielectric constant film is selected from film comprised of enhanced dielectric materials including Al_2O_3 and PrO_2 .

Ramkumar discloses a process for forming nitrogen-rich silicon oxide-based dielectric materials. In this process, an oxidizing apparatus is provided (step 200). Next, wafers are positioned in a processing chamber (step 220). An oxidizing atmosphere is directed to the wafers in the processing chamber so that a silicon oxide layer is formed on the wafer (step 240). At step 260, nitrous oxide is provided to a torch zone of the oxidizing apparatus to form a nitridizing atmosphere. Next, the nitridizing atmosphere formed in step 260 is directed from the torch chamber to the process chamber.

Ramkumar, however, fails to disclose, teach, or suggest at least that the high-dielectric constant film is selected from film comprised of enhanced dielectric materials including Al_2O_3 and PrO_2 . Accordingly, *Ramkumar* fails to remedy the deficiencies of *Jeon*

In summary, *Jeon* and *Ramkumar* either singly or combined fail to disclose, teach, or suggest at least that the high-dielectric constant film is selected from film comprised of enhanced dielectric materials including Al_2O_3 and PrO_2 . In fact, neither *Jeon* or *Ramkumar* disclose or suggest that any components containing the elements Al_2O_3 and PrO_2 are used. As a result, a *prima facie* case for obviousness has not been established.

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Moreover, obviousness "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys. V. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). For at least the above reasons, Applicant respectfully requests that the rejection of claim 13 be withdrawn, and claim 4 be allowed.

Claims 2 and 5 depend from claim 1, and claims 14-16 depend from claim 13. By virtue of this dependency, Applicant submits that claims 2, 5, and 14-16 are allowable for at least the same reasons given above with regard to their respective base claims. In addition, Applicant submits that claims 2, 5, and 14-16 are further distinguished over *Jeon* and *Ramkumar* by the additional elements recited therein, and particularly with respect to each claimed combination. Applicant respectfully requests, therefore, that the rejection of claims 2, 5, and 14-16 under 35 U.S.C. §103 be withdrawn, and these claims be allowed.

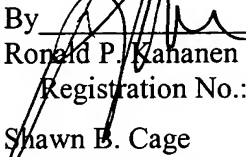
Conclusion

Based on at least the foregoing amendments and remarks, Applicants submit that claims 1-5 and 13-16 are allowable, and this application is in condition for allowance. Accordingly, Applicants request favorable reexamination and reconsideration of the application. In the event the Examiner has any comments or suggestions for placing the application in even better form, Applicants request that the Examiner contact the undersigned attorney at the number listed below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. SON-2612/DIV from which the undersigned is authorized to draw.

Dated: June 28, 2005

Respectfully submitted,

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